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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/008,531	01/16/1998	HOWARD E. RHODES	MIO 0012 V2	6336

23368 7590 06/27/2008

DINSMORE & SHOHL LLP
ONE DAYTON CENTRE, ONE SOUTH MAIN STREET
SUITE 1300
DAYTON, OH 45402-2023

EXAMINER	
TRINH, MICHAEL MANH	
ART UNIT	PAPER NUMBER
2822	

MAIL DATE	DELIVERY MODE
06/27/2008	PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HOWARD E. RHODES

Appeal 2007-4440
Application 09/008,531
Technology Center 2800

Decided: June 27, 2008

Before JOSEPH F. RUGGIERO, ANITA PELLMAN GROSS, and MAHSHID D. SAADAT, *Administrative Patent Judges*.

RUGGIERO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from the Final Rejection of claims 21-25, 31, and 32. We have jurisdiction under 35 U.S.C. § 6(b).

Appellant's claimed invention relates to a method of making a semiconductor device in which a conductive layer having a substantially

vertical component is formed. After an overlayer is formed over the conductive layer, a contact hole is etched in the overlayer with the etch extending into the substantially vertical component of the conductive layer. (Specification 4-6).

We affirm-in-part.

Independent claim 21 is illustrative of the invention and reads as follows:

21. A process for making a semiconductor device comprising the steps of:

providing a substrate having at least one semiconductor layer;

forming an underlayer having an opening over the at least one semiconductor layer;

forming a layer of conductive material over the underlayer and in said opening, said layer of conductive material having a topography that includes a substantially vertical component in said opening;

forming an overlayer over the said layer of conductive material said overlayer having a thickness greater than said underlayer;

etching a contact hole in said overlayer and in an overetch amount into but not through the substantially vertical component of said layer of conductive material in said opening; and

forming a contact in said contact hole disposed adjacent to and directly contacting said vertical component.

The Examiner relies on the following prior art references to show unpatentability:

Jun	US 5,459,094	Oct. 17, 1995
Jost	US 5,563,089	Oct. 8, 1996

Claims 31 and 32 stand rejected under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the invention.

Claims 21, 22, 23, and 25 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Jost.

Claims 21-25, 31, and 32, all of the appealed claims, stand rejected under 35 U.S.C. § 102(e) as being anticipated by Jun.[1]

Rather than reiterate the arguments of Appellant and the Examiner, reference is made to the Brief and Answer for the respective details. Only those arguments actually made by Appellant have been considered in this decision. Arguments which Appellant could have made but chose not to make in the Briefs have not been considered and are deemed waived [see 37 C.F.R. § 41.37(c)(1)(vii)].

ISSUES

(i) Under 35 U.S.C. § 112, second paragraph, with respect to appealed claims 31 and 32, would the skilled artisan, upon reading the claims in light of the specification, be able to ascertain the scope of the invention recited in the claims.

(ii) Under 35 U.S.C. § 102(e), does Jost have a disclosure which anticipates the invention set forth in claims 21, 22, 23, and 25?

[1] As indicated at page 3 of the Answer, the Examiner has withdrawn the 35 U.S.C. § 103(a) rejection of claims 21, 22, 24, 31, and 32 based on the combination of Bergemont (U.S. Patent No. 5,484,741), Toshiyuki (JP-05-109905), and Zamanian (U.S. Patent No. 5,793,111).

(iii) Under 35 U.S.C. § 102(e), does Jun have a disclosure which anticipates the invention set forth in claims 21-25, 31, and 32?

PRINCIPLES OF LAW

Indefiniteness

The general rule is that a claim must set out and circumscribe a particular area with a reasonable degree of precision and particularity when read in light of the disclosure as it would be by the artisan. *In re Moore*, 439 F.2d 1232, 1235, (CCPA 1971). Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed in light of the specification. *Seattle Box Co. v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 826, (Fed. Cir. 1984). *See also Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366, (Fed. Cir. 2004) ("The requirement to 'distinctly' claim means that the claim must have a meaning discernible to one of ordinary skill in the art when construed according to correct principles...Only when a claim remains insolubly ambiguous without a discernible meaning after all reasonable attempts at construction must a court declare it indefinite.").

Anticipation

It is axiomatic that anticipation of a claim under § 102 can be found if the prior art reference discloses every element of the claim. *See In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986) and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.,* 730 F.2d 1452, 1458 (Fed. Cir. 1984).

In rejecting claims under 35 U.S.C. § 102, a single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation. *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375-76 (Fed. Cir. 2005), citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992). Anticipation of a patent claim requires a finding that the claim at issue "reads on" a prior art reference. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999) ("In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.") (internal citations omitted).

ANALYSIS

35 U.S.C. § 112, second paragraph, rejection of claims 31 and 32

After reviewing the language of independent claim 31, it is apparent, as set forth by the Examiner (Ans. 3), that the terminology "said underlayer" at line 8 lacks a clear antecedent basis. Claim 32 incorporates this deficiency of claim 31 by dependence. Appellant does not dispute the appropriateness of the Examiner's rejection and has expressed on the record a willingness to amend claim 31 to provide proper antecedent basis for the term "underlayer." (App. Br. 4; Reply Br. 2). Accordingly, the Examiner's 35 U.S.C. § 112, second paragraph, rejection of appealed claims 31 and 32 is sustained.

35 U.S.C. § 102(e) rejection of claims 21-23 and 25 based on Jost

With respect to the 35 U.S.C. § 102(e) rejection of appealed independent claim 21 based on the Jost reference, the Examiner indicates (Ans. 4) how the various limitations are read on the disclosure of Jost. In particular, the Examiner directs attention to the illustrations in Figures 10-12 of Jost as well as the accompanying description beginning at column 5, line 40 of Jost.

Appellant's arguments in response assert that the Examiner has not shown how each of the claimed features is present in the disclosure of Jost so as to establish a prima facie case of anticipation. Appellant's arguments focus on the contention that, in contrast to the claimed invention, Jost does not disclose overetching into but not through the vertical component of the conductive layer in the opening formed over the semiconductor layer. According to Appellant (App. Br. 5; Reply Br. 2-3), while Jost discloses the overetching of layer 44a into the conductive layer 40, this overetching extends only into the upper surface of layer 40 and not into the vertical component of layer 40.

After reviewing the disclosure of Jost in light of the arguments of record, however, we find ample evidence in Jost to support the Examiner's position. As indicated by the illustration in Figure 11 of Jost, the formation of the curved upper portion of the vertical component of conductive layer 40 next to element 51 is evidence of the fact that this conductive layer vertical component has been etched "into" but not through since the vertical component remains in the opening after etching. Further evidence that Jost satisfies the claimed feature of overetching into but not through the conductive layer is also provided by Jost's Figure 11 illustration which

shows that, as pointed out by the Examiner (Ans. 8-9), the vertical component of Jost's conductive layer is etched to a point that is recessed below the upper surface of underlayer 28.

In view of the above discussion, since all of the claimed limitations are present in the disclosure of Jost, the Examiner's 35 U.S.C. § 102(e) rejection of appealed independent claim 21 is sustained.

Turning to a consideration of the Examiner's 35 U.S.C. § 102(e) rejection of dependent claims 22 and 23 based on Jost, we sustain this rejection as well. We find no error in the Examiner's finding of correspondence of the vertical component spacer features disclosed by Jost with those set forth in claims 22 and 23. As explained by the Examiner (Ans. 4, 8, and 9), as illustrated in Figure 11 of Jost, the vertical component of Jost's conductive layer 40 is a "spacer" which lines the wall of the opening in underlayer 28. This spacer defines a "localized thick region" similar to what is described by Appellant at page 11, lines 5-7 of the Specification.

The Examiner's rejection of dependent claim 25 based on Jost is sustained as well. Appellant's arguments (App. Br. 6) to the contrary notwithstanding, we find, as did the Examiner (Ans. 9), that Jost provides a disclosure (col. 5, ll. 12-15) of the patterning and etching of cell poly conductive layer 40 for capacitor construction.

35 U.S.C. § 102(e) rejection of claims 21-25, 31, and 32 based on Jun

This rejection is not sustained. In addressing the requirements of independent claims 21 and 31, the Examiner directs attention to the illustrations in Figures 4a-4f and 8a-8f of Jun. According to the Examiner

(Ans. 4, 5, 10, and 11), the etching of the contact hole in Jun's overlayer 17, instead of ending at the conductive layer, continues so as to overetch the conductive layer into the vertical component of the conductive layer as claimed.

We find no basis in the disclosure of Jun, however, to support the Examiner's interpretation. In particular, we find no vertical component of the conductive layer 16 in Jun, nor has the Examiner identified any, into which an overetch occurs as is required by each of the appealed independent claims 21 and 31. We agree with Appellant (App. Br. 7-8; Reply Br. 3) that a skilled artisan would recognize that, at best, Jun discloses overetching into a horizontal component of the conductive layer 16, not a vertical component as claimed.

In view of the above discussion, since all of the claimed limitations are not present in the disclosure of Jun, the Examiner's 35 U.S.C. § 102(e) rejection of appealed independent claims 21 and 31, as well as claims 22-25 and 32 dependent thereon, is not sustained.

CONCLUSION

In summary, with respect to the Examiner's rejections of the appealed claims, we have sustained the 35 U.S.C. § 112, second paragraph, rejection of claims 31 and 32, as well as the 35 U.S.C. § 102(e) rejection of claims 21-23 and 25 based on Jost. We have not sustained the Examiner's 35 U.S.C. § 102(e) rejection of claims 21-25, 31, and 32 based on Jun. Accordingly, the Examiner's decision rejecting appealed claims 21-25, 31, and 32 is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv)(effective September 13, 2004).

AFFIRMED-IN-PART

gvw

DINSMORE & SHOHL LLP
ONE DAYTON CENTRE
ONE SOUTH MAIN STREET
SUITE 1300
DAYTON, OH 45402-2023